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The conditional relationship between beta and returns: recent evidence from international stock markets

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Abstract

The risk–return relationship is one of the fundamental concepts in finance that is most important to investors and portfolio managers. Finance theory argues that the beta or systematic risk is the only relevant risk measure for investors. However, many studies have showed that betas and returns are not related empirically, no matter in domestic markets or in international stock markets. This paper examines the conditional relationship between beta and returns in international stock markets for the period from January 1991 to December 2000. After recognizing the fact that while expected returns are always positive, realized returns could be positive or negative, we find a significant positive relationship between beta and returns in up market periods (positive market excess returns) but a significant negative relationship in down market periods (negative market excess returns). The results are robust for both monthly and weekly returns and for two different proxies of the world market portfolio. Our findings indicate that beta is still a useful risk measure for portfolio managers in making optimal investment decisions.

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1. Introduction

The risk–return relationship is one of the fundamental concepts in finance that is most important to investors and portfolio managers. One of their tasks is to estimate the investment risk. The famous Capital Asset Pricing Model, CAPM (Black, 1972; Lintner, 1965; Sharpe, 1964) argues that beta or systematic risk is the only relevant risk measure for investment and a positive trade-off between beta and expected returns should exist. Because of its importance and relevance to all investors, it is one of the most extensively tested financial models in the literature.

The CAPM states that the expected return of an asset is a positive function of three variables: beta (the covariance of asset returns and market returns divided by the variance of the market returns), the risk-free rate and the expected market return. The major focus of the tests on CAPM is to check whether returns are statistically positively related to betas. Since in reality only realized asset/market returns are available, average realized returns are used to proxy the expected returns and returns on security index are used to proxy the market returns. Empirical tests in 1970s (e.g. Fama & MacBeth, 1973) support the validity of the CAPM. However, empirical evidence in 1990s (e.g. Fama and French, 1992, 1996; Jegadeesh, 1992) indicates that betas are not statistically related to returns, and so some researchers conclude that beta is dead and suspect the validity of beta in measuring risk.

Previous empirical tests are mainly based on the Fama and MacBeth (1973) methodology. However Isakov (1999) argued that this methodology does not leave much opportunity for beta to appear as a useful risk measure in the risk–return relationship for two reasons. First, the model is expressed in terms of expected returns; however, tests can only be performed on realized returns. Secondly, the realized market excess return does not behave as expected since it is too volatile and is often negative.

Recent studies (e.g. Pettengill, Sundaram, & Mathur, 1995 for the US market; and Isakov, 1999 for the Swiss market) suggested an alternative approach to assess the reliability of beta as a measure of risk. The alternative approach is that when the realized market returns exceed the risk-free rate of interest (i.e. the realized market excess returns are positive), the betas and realized excess returns should have a positive relationship. Similarly, when the realized market excess returns are negative, the betas and realized excess returns should have a negative relationship. This paper extends this approach and applies it to 13 international stock markets. The results show that beta is still a good measure of risk and is significantly related to realized returns in both up and down market situations. Hence, beta is still a useful measure of risk for investors in making optimal investment decisions.

The rest of the paper is organized as follows: Section 2 presents the theoretical framework used in this paper. Section 3 provides a literature review of the relationship between beta and returns. Section 4 describes the data and methodologies used. Section 5 reports our empirical results and Section 6 concludes the paper.

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